

WHAT IS CLAIMED IS:

1. A method of treating systemic lupus erythematosus patient comprising:  
administering gene-modified T cells having suppressed expression of cAMP  
5 response element modulator to said systemic lupus erythematosus patient, thereby  
increasing the expression of IL-2.
2. The method of claim 1, wherein said gene modified T cells are from said  
patient.
3. The method of claim 1, wherein said T cells having suppressed expression of  
10 cAMP response element modulator, have been treated with antisense CREM.
4. The method of claim 1, further comprising transfecting said T cells with TCR  $\zeta$   
chain to further increase the expression of IL-2.
5. The method of claim 1, wherein said patient is a human.
6. A method of treating systemic lupus erythematosus T cells comprising:  
15 (a) administering anti-sense cAMP response element modulator to T cells from a  
patient with systemic lupus erythematosus to prevent cAMP response element modulator  
from binding to an IL-2 promotor in said T cell; and  
(b) increasing the production of IL-2 in said T cells.
7. The method of claim 6, further comprising: after step (b) reinserting said T  
20 cells into said patient.
8. The method of claim 6, wherein said anti-sense cAMP response element  
modulator is administered in the form of an anti-sense cAMP response element  
modulator plasmid.

9. The method of claim 6, wherein said antisense cAMP response element modulator, is  $\alpha$ -antisense cAMP response element modulator.

10. A method of treating a patient with systemic lupus erythematosus comprising:

- a) removing lymphocytes from a patient having systemic lupus erythematosus;
- 5 b) leukopheresing said lymphocytes;
- c) transfecting said lymphocytes with plasmid vectors containing anti-sense cAMP response element modulator; and
- d) re-infusing said transfected lymphocytes into the patient.

11. The method of claim 10, wherein said antisense cAMP response element modulator, is  $\alpha$ -antisense cAMP response element modulator.

12. A method of treating systemic lupus erythematosus T cells to increase the level of IL-2 mRNA therein comprising: decreasing the amount of cAMP response element modulator mRNA.

13. The method of claim 12, wherein the cAMP response element modulator mRNA is decreased by inserting antisense cAMP response element modulator into said T cell.

14. The method of claim 12, wherein in said cAMP response element modulator mRNA, is  $\alpha$  cAMP response element modulator mRNA.

15. The method of treating a human patient having systemic lupus erythematosus comprising administering said T cells that have decreased cAMP response element modulator mRNA to said patient.

20 16. A method of increasing IL-2 production in T cells from a patient with systemic lupus erythematosus comprising:

administering anti-sense cAMP response element modulator to T cells extracted from a patient with systemic lupus erythematosus; and preventing cAMP response element modulator from binding to an IL-2 promotor in said T cell, thereby increasing the production of IL-2.

5           17. The method of claim 16, wherein said patient is a human.

18. A method of treating systemic lupus erythematosus comprising:

- a) removing T cells from a patient having systemic lupus erythematosus;
- b) transfecting said T cells with TCR  $\zeta$  chain;
- c) reinserting said T cells into said patient.

10          19. The method of claim 18, wherein said T cells are transfected by nucleoporation.

20. The method of claim 18, wherein after said T cells are removed from said patient, mixing said cells with a plasmid DNA construct.

21. The method of claim 18, further comprising incubating said T cells after they are transfected.

15          22. A method of treating T cells from patients having systemic lupus erythematosus to restore T cell signaling and augment TCR/CD3-induced interleukin-2 production comprising:

- a) removing and isolating T cells from a patient having systemic lupus erythematosus;
- b) transfecting said T cells with a TCR  $\zeta$  chain contained in a vector, wherein said transfecting is by nucleoporation;
- c) incubating said T cells; and

d) restoring said T cells signaling and augmenting TCR/CD3-induced interleukin-2 production.

23. The method of claim 22, wherein said incubating is at 37° C in 5% CO<sub>2</sub>.

24. The method of claim 22, wherein said vector is a pcDNA3.1/V5-HisTopo  
5 vector.

25. The method of claim 22, wherein said patient is a human.

26. A method of a treating systemic lupus erythematosus patient comprising:

a) removing T cells from said patient;

b) treating said T cells from said patient with antisense cAMP response element

10 modulator to suppress the expression of cAMP response element modulator to increase  
the expression of IL-2;

c) transfecting said T cells with TCR  $\zeta$  chain to further increase the expression of  
IL-2; and

d) administering said treated and gene-modified T cells to said systemic lupus  
15 erythematosus patient, thereby increasing the expression of IL-2.

27. The method of treating systemic lupus erythematosis patient's T cells  
comprising: reducing cAMP response element modulator  $\alpha$  from binding to an -180 site  
of an IL-2 promoter in said T cells by transfecting said T cells with the anti-sense cAMP  
response element modulator  $\alpha$ .

20 28. The method of claim 27, further comprising administering said transfected T  
cells to said patient intravenously.